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Examination of Ordering Effects in Sound Evaluations

Yiyun Zhang, Patricia Davies and Daniel Carr
Ray W. Herrick Laboratories, School of Mechanical Engineering, Purdue University

ABSTRACT

It is difficult to predict sound annoyance responses because annoyance is an inherently subjective concept and the evaluation standard could be different from each person. Usually, annoyance models are functions of strengths of sound characteristics only, and these models can help engineers to improve sounds that machines make and minimize annoyance levels, but other factors can also influence annoyance ratings of products. The main goal of this research was to investigate ordering effects in sound evaluations when people are hearing a set of sounds in sequence. Of particular interest is how the response to a sound influences the response to the next sound the subject hears. Response data from two previously conducted tests to evaluate sounds were re-examined. An additional memory term was added to the current model by using the annoyance rating from the last heard sound. The performance of the improved model was compared to the original model, and the coefficients of determination were calculated. The results showed that, in general, the addition of the memory term increased the model accuracy, and the growth was more obvious in the test where subjects evaluated transient sounds than in the test in which steady-state sounds were evaluated. The growth of model accuracy indicates that for some subjects the evaluation of the previous sound strongly affects the evaluation of the sound presented. A follow-up test is being conducted to determine if the initial cursor placement on each rating scale can amplify or attenuate the observed memory effects.

KEYWORDS

Psychoacoustics, Transfer Bias, Ordering Effects